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REMARKS

This Amendment is respectfully submitted to place subject divisional Application in condition for allowance. In particular, Claims 29 and 30 have been canceled, and Claims 21 and 28 have been amended to more particularly point out and distinctly claim the subject matter which applicants regard as the invention.

Claim 21 has been amended to recite

partitioning by distillation the organic feedstock to provide at least one low-boiling organic part consisting of a sulfur-lean, mono-aromatic-rich fraction **having a sulfur level of no more than 25 ppm** , and a high-boiling organic part consisting of a sulfur-rich, mono-aromatic-lean fraction;

contacting a gaseous source of dioxygen with at least a portion of the low-boiling organic part in a liquid reaction medium containing a **particulate,** heterogeneous a heterogeneous oxygenation catalyst system which exhibits a capability to enhance the incorporation of oxygen into a mixture of liquid organic compounds and comprises one or more catalyst metal selected from the group consisting of chromium, molybdenum, bismuth, manganese, iron, and platinum, while maintaining the reaction medium substantially free of halogen and/or halogen-containing compounds, to form a liquid mixture comprising hydrocarbons, oxygenated organic compounds, water of reaction, and acidic co-products , **such that the oxygenation of the hydrocarbon portion of the liquid mixture is more than 1 percent by weight ;**

separating from the mixture at least a first organic liquid of low density comprising hydrocarbons, oxygenated sulfur-containing, oxygenated nitrogen-containing and other oxygenated organic compounds and acidic co-products and at least portions of the catalyst metal, water of reaction and acidic co-products, and a second separated liquid which is an aqueous solution containing at

least a portion of the oxidized sulfur-containing and/or nitrogen-containing organic compounds; and

recovering a low-boiling oxygenated product having a low content of **nitrogen**, acidic co-products **and a sulfur content of no more than 15 ppm** .

Claim 28 has been amended to recite the process according to claim 21 further comprising blending at least a portion of the low-boiling oxygenated product with at least a portion of the high-boiling product to obtain components **that exhibit sulfur levels of less than about 15 ppm**, for refinery blending of **ultra-low sulfur** transportation fuel.

Support for these amendments is found in the Specification, for example at page 12, lines 9 to 24, and page 41, line 15 to page 42, line 22.

Attention of Examiner is invited to Example 5, at page 41 of the Specification, wherein Applicants demonstrate a heterogeneous catalytic oxygenation according to the invention of a hydrotreated refinery distillate having an analysis of 20 ppm of sulfur, 18 ppm of nitrogen. The stirred autoclave was charged with distillate and a particulate oxygenation catalyst containing bismuth molybdate/iron promoted with magnesium. Analyses of the organic liquid of low density determined a sulfur content of 12 ppm, a nitrogen content of 7 ppm, and a total acid number of 2.37 mg KOH/g. Oxygenation of the hydrocarbon portion of the product was 1.48 percent by weight.

In Example 6, at page 41 to page 42 of the Specification, Applicants demonstrate a heterogeneous catalytic oxygenation according to the invention of an another portion of the hydrotreated distillate oxygenated in Example 5. The stirred autoclave was charged with and a particulate oxygenation catalyst containing 18 percent chromium as oxide and 1.5 percent platinum on γ-Al_2O_3 ($CrOPt/Al_2O_3$). Analyses of the organic liquid of low density

determined a sulfur content of 9 ppm, a nitrogen content of 8 ppm, and a total acid number of 2.89 mg KOH/g. Oxygenation of a hydrocarbon product was 1.01 percent by weight.

In Example 7, at page 42 of the Specification, Applicants demonstrate a heterogeneous catalytic oxygenation according to the invention of an another portion of the hydrotreated distillate oxygenated in Example 5. The stirred autoclave was charged with distillate and a particulate oxygenation catalyst containing 0.5 percent $Na_2Cr_2O_7$ on γ-Al_2O_3. Analyses of the organic liquid of low density determined a sulfur content of 6 ppm, a nitrogen content of 9 ppm, and a total acid number of 7.77 mg KOH/g. Oxygenation of a hydrocarbon product was 2.45 percent by weight.

In view of these unexpected and unpredictable experimental results, Applicants urge that Claims 21 to 28, all claims now presented, are commensurate in scope with the evidence. Applicant respectfully requests Examiner to pass subject application for allowance.

Claim Rejections - 35 U.S.C. § 103(a)

In outstanding Office Action, Claims 21 to 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 02 52 606 in view of Schultz et al. (US 2,365,220) and Farkas et al. (US 2,472,152). Applicants respectfully traverse these rejections.

The EP reference of record relates to a process for improving the cetane number of a heavy aromatic naphtha extract by catalytic oxidation of benzylic carbon atoms in organic compounds of the extract. Example 1 of the EP reference describes a feed mixture of organic compounds (equal volumes of extract and acetonitrile), and distilled water with copper sulfate pentahydrate and potassium persulfate. After separation from the aqueous portion of the reacted mixture, the oily product was washed with distilled water

and the acetonitrile removed by distillation. This organic product of oxidation was again treated, but for double the time of the first treatment. While the sulfur level observed in the final oxidized product was reduced by about 44 percent from the sulfur level in the starting extract, the final sulfur level, 0.42 weight percent (4,200 ppm), was higher than the product of the first oxidation, 0.38 weight percent (3,800 ppm). But then, the EP reference process is self-described as a process for improving the cetane number of distillate fuel, NOT for reduction of sulfur and/or nitrogen levels. Sulfur level was reduced to 0.10 weight percent (1,000 ppm) by a single oxidation, in the only other example in the EP reference.

By contrast, Applicants' novel process employs a particulate, heterogeneous oxygenation catalyst system which comprises one or more catalyst metal selected from the group consisting of chromium, molybdenum, bismuth, manganese, iron and platinum. Claim 21 now recites recovery of a low-boiling oxygenated product having a low content of nitrogen, acidic co-products and a sulfur content of no more than 15 ppm. Analyses of Applicants' organic liquid of low density determined sulfur contents below 10 ppm, and even as low as 6 ppm (see Example 7).

The process described in the EP reference is different in kind, not merely degree, from Applicants; novel process.

It is therefore the position of Applicants that the EP reference of record in not relevant prior art to the novel process as recited by instant Claims 21 to 28.

Schultz et al. suggests need for neutralizing acids in hydrocarbon effluent from non-catalytic oxidation, but does not disclose or suggest a presence of any sulfur or nitrogen containing compounds.

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Farkas et al. is directed to preparation of high cetane number Diesel engine fuel by adding organic peroxides and/or organic hydroperoxides thereto. The Farkas et al. reference describes neutralizing acids in hydrocarbon effluent from non-catalytic oxidation, but does not disclose or suggest a presence of any sulfur or nitrogen containing compounds.

The Schultz et al. and/or Farkas et al. references in combination with the EP reference do not disclose or suggest the results of Applicants' process.

Base on the amendments submitted above and earlier, Applicants urge that Claims 21 to 28 inclusive, all claims now presented, are in condition for allowance. Applicant respectfully requests Primary Examiner Griffin to pass subject application for allowance.

Do not hesitate to contact Frederick S. Jerome whose telephone number is (630) 832-7974 (FAX (630) 832-7976) if additional assistance is needed regarding this paper or earlier papers for Applicants.

Applicants and their undersigned Attorney appreciate Examiner's attention and consideration of this matter.

Respectfully submitted,

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